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EXAMINER
AUGHENBAUGH, WALTER

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 09/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/696,220	KOKURA ET AL.	
	Examiner	Art Unit	
	Walter B Aughenbaugh	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 7-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *14* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Acknowledgement of Applicant's Amendments

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 21, 2003 (Paper 13) has been entered.

2. The amendments made in claims 1, 7, 11 and 12 given on pages 1-3 and 11-13 of Paper 13 have been received and considered by Examiner.

3. New claims 15-17 presented on page 4 of Paper 13 have been received and considered by Examiner.

WITHDRAWN REJECTIONS

4. The 35 U.S.C. 112, first paragraph rejection of claim 7 has been withdrawn due to Applicant's amendments to claim 7 in Paper 13.

5. The 35 U.S.C. 102(e) rejection of claims 1, 12 and 13 as anticipated by Kurogane et al. made of record in paragraph 14 of Paper 11 has been withdrawn due to Applicant's amendments in Paper 13.

6. The 35 U.S.C. 103(a) rejection of claims 2, 4, 5 and 14 over Kurogane et al. in view of Mitsui et al. made of record in paragraph 15 of Paper 11 has been withdrawn due to Applicant's amendments in Paper 13.

7. The 35 U.S.C. 103(a) rejection of claim 3 over Kurogane et al. made of record in paragraph 16 of Paper 11 has been withdrawn due to Applicant's amendments in Paper 13.

8. The 35 U.S.C. 103(a) rejection of claims 7-10 over Mitsui et al. in view of Kurogane et al. made of record in paragraph 17 of Paper 11 has been withdrawn due to Applicant's amendments in Paper 13.

9. The 35 U.S.C. 103(a) rejection of claim 11 over Kurogane et al. in view of Mitsui et al. made of record in paragraph 18 of Paper 11 has been withdrawn due to Applicant's amendments in Paper 13.

REPEATED OBJECTIONS

10. The new matter objection to the specification previously made of record in paragraph 11 of Paper 11 has been repeated for reasons previously made of record in paragraph 11 of Paper 11. While the phrase "address lines" has been removed from claim 7, the phrase "address lines" remains in the language of claim 11. In response to Applicant's arguments on pages 5-6 of Paper 13, the phrase "address lines" is not discussed in relation to "data (S/D) and gate lines" in the cited portion of the specification of the instant application (page 11, lines 11-15). The phrase "address lines" is not supported by the specification of the instant application.

REPEATED REJECTIONS

11. The 35 U.S.C. 112, first paragraph rejection of claim 11 has been repeated for the reasons previously made of record in paragraph 13 of Paper 11 and for the reasons discussed in regard to the repeated new matter objection to the specification provided in the previous paragraph of this Office Action (Paper 15).

NEW REJECTIONS

Claim Rejections - 35 USC § 112

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claims 5, 11 and 13-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation "insulating film" in the first line of the claim. There is insufficient antecedent basis for this limitation in the claim.

In regard to claim 11, use of the word "wherein" in the third line of the claim is not appropriate; the claim recites that the LCD comprises certain components (an LCD wouldn't comprise "wherein address lines...". In the ninth line of the claim "directly" should be amended to "direct". The structure recited in the last three lines of the claim is indefinite. The recitation "the molybdenum" in the ninth line of the claim is not commensurate with the scope of the claim set by the phrase "a film comprising molybdenum" in the eighth line of the claim; the phrase "a film comprising molybdenum" does not require that the molybdenum be on the outside of the film so that the molybdenum is in contact with other layers, such as in the case when the "a film comprising molybdenum" is a multilayer film. The structure recited by the phrase "between which the molybdenum is directly sandwiched" cannot be ascertained: to which components of the LCD does the phrase "between which" refer?

In regard to claim 13, "TFT" must be spelled out in full.

In regard to claim 14, "Al" must be spelled out in full.

In regard to claims 15-17, the structure intended to be recited by the phrase "areas spaced apart from" cannot be ascertained. What determines the distance that "spaced apart from" would constitute?

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. Claims 12 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirakawa.

Hirakawa teaches an electronic device (a semiconductor device) comprising a substrate (item 101) supporting an insulating layer (interlayer insulating film, item 104) and a conductive electrode layer (corresponding to the aluminum layer of the conductive laminate film labeled as item 106) and a layer comprising molybdenum nitride (corresponding to the barrier metal layer of the laminate film labeled as item 106) (col. 3, line 20-col. 4, line 8). Hirakawa teaches that the barrier metal layer is below the aluminum layer in the frame of reference of Fig. 1 (col. 4, lines 5-8), and Fig. 1 shows that the barrier metal/aluminum laminate film (item 106) is laminated on the interlayer insulating film (item 104); therefore, Hirakawa teaches that the molybdenum nitride is located between and contacting each of the insulating layer (item 104) and the conductive electrode layer such that the molybdenum nitride is located below the conductive electrode layer and above the insulating layer (item 104) so that the insulating layer (item 104) is between the substrate (item 101) and the molybdenum nitride so that a bottom surface of the molybdenum nitride is located over and contacting a top surface of the insulating layer (item 104) and a top surface of the molybdenum nitride is located under and contacting the conductive electrode (see Fig. 1). In further regard to claim 14, aluminum is a reflective metal.

Claim Rejections - 35 USC § 103

16. Claims 1, 2, 4, 5, 7, 9, 11 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsui et al. in view of Hirakawa.

In regard to claim 1, Mitsui et al. teach a liquid crystal display (LCD) comprising at least one thin film transistor (TFT) (item 40), an interlayer insulator (insulating film, item 42) and at least one reflective pixel electrode (reflective metal film, item 38) defining at least part of a pixel of the LCD and being supported by a substrate (item 31) (col. 9, lines 43-55).

Mitsui et al. fail to teach that a film comprising molybdenum nitride is formed immediately below and in contact with the reflective pixel electrode and above and contacting the interlayer insulator so that the molybdenum nitride is at least partially located between and contacting each of the reflective pixel electrode and the interlayer insulator so that a bottom surface of the molybdenum nitride is located over and contacting a top surface of the interlayer insulator and a top surface of the molybdenum nitride is located under and contacting the reflective pixel electrode.

Hirakawa, however, discloses a semiconductor device comprising a laminate of an interlayer insulating film (item 104) and a film (item 106) that is a laminate of a barrier metal having a high melting point and aluminum (col. 3, lines 39-66 and Fig. 1). Hirakawa discloses that the barrier metal having a high melting point is molybdenum nitride (col. 4, lines 5-8). Hirakawa discloses that the barrier metal layer is below the aluminum layer in the frame of reference of Fig. 1 (col. 4, lines 5-8), and Fig. 1 shows that the barrier metal/aluminum laminate film (item 106) is laminated on the interlayer insulating film (item 104); therefore, Hirakawa discloses that the molybdenum nitride barrier metal layer is immediately below and in contact

with the aluminum layer and above and contacting the interlayer insulator (item 104) so that the molybdenum nitride is at least partially located between and contacting each of the aluminum layer and the interlayer insulator (item 104) so that a bottom surface of the molybdenum nitride is located over and contacting a top surface of the interlayer insulator (item 104) and a top surface of the molybdenum nitride is located under and contacting the aluminum layer.

Therefore, one of ordinary skill in the art would have recognized to have provided a molybdenum nitride layer between the insulating film (item 42) and the reflective metal film (item 38) of Mitsui et al. in such a manner that the molybdenum nitride barrier metal layer is immediately below and in contact with the reflective metal film (item 38) and above and contacting the insulating film (item 42) so that the molybdenum nitride is at least partially located between and contacting each of the reflective metal film (item 38) and the insulating film (item 42) so that a bottom surface of the molybdenum nitride is located over and contacting a top surface of the insulating film (item 42) and a top surface of the molybdenum nitride is located under and contacting the reflective metal film (item 38) since molybdenum nitride is a notoriously well known barrier metal having a high melting point for use as a barrier layer that separates insulating and aluminum layers as taught by Hirakawa.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a molybdenum nitride layer between the insulating film (item 42) and the reflective metal film (item 38) of Mitsui et al. in such a manner that the molybdenum nitride barrier metal layer is immediately below and in contact with the reflective metal film (item 38) and above and contacting the insulating film (item 42) so that the molybdenum nitride is at least partially located between and contacting each of the reflective metal film (item 38) and

the insulating film (item 42) so that a bottom surface of the molybdenum nitride is located over and contacting a top surface of the insulating film (item 42) and a top surface of the molybdenum nitride is located under and contacting the reflective metal film (item 38) since molybdenum nitride is a notoriously well known barrier metal having a high melting point for use as a barrier layer that separates insulating and aluminum layers as taught by Hirakawa.

In regard to claim 2, Mitsui et al. teach that the reflective pixel electrode (item 38) comprises aluminum (col. 14, lines 54-56).

In regard to claim 4, Mitsui et al. teach that the interlayer insulator (item 42) comprises a photosensitive resin (col. 6, lines 6-19 and 54-68).

In regard to claim 5, Mitsui et al. teach that the insulating film comprises a high molecular resin (equivalently a polymeric resin) (col. 5, lines 14-16).

In regard to claim 15, Mitsui et al. teach that the pixel electrode (item 38) is in electrical communication with a drain electrode (item 37 of Mitsui et al.) of the TFT through a contact hole (item 43 of Mitsui et al.) defined in the interlayer insulator (item 42) (col. 9, lines 43-52 and Fig. 5). Furthermore, since Fig. 5 of Mitsui et al. shows that the reflective pixel electrode (item 38) extends well to the right of the contact hole (item 43) along the interlayer insulator (item 42), the combination of Mitsui et al. with Hirakawa results in the combination of the reflective pixel electrode (item 38) located over and contacting the film comprising molybdenum nitride at least in areas spaced apart from the contact hole (e.g. the bumps 42a, or any given group of bumps, excluding the first bump to the right of the contact hole 43 are "areas spaced apart from" the contact hole, col. 9, lines 53-59).

In regard to independent claim 7 and claim 9, Mitsui et al. teach a liquid crystal display comprising a liquid crystal layer (item 49) between a pair of substrates (items 31 and 45) (col. 10, lines 13-17 and Figure 5). Mitsui et al. also teach that the liquid crystal display has reflection electrodes (item 38) that are composed of aluminum formed on the insulating film (item 42) (col. 9, lines 65-68 and Figure 5). Mitsui et al. further teach a laminated layer provided on at least one of the substrates wherein the laminated layer comprises an insulating film (item 42, col. 9, lines 53-55 and Figure 5). The reflective metal film (item 38) of Mitsui et al. necessarily has a light reflecting function and is provided in at least one pixel region of the display for contributing to displaying of images in the display as shown in Figure 5; therefore, in regard to claim 9, the reflective metal film (item 38) is a pixel electrode for applying a voltage to the liquid crystal layer.

Mitsui et al. fail to teach that the laminated layer comprises a film comprising molybdenum nitride laminated to and over at least part of the insulating film so that the molybdenum nitride contacts an upper surface of the insulating film and that the reflective metal film is formed on the laminated layer so as to contact the molybdenum nitride.

Hirakawa, however, discloses a semiconductor device comprising a laminate of an interlayer insulating film (item 104) and a film (item 106) that is a laminate of a barrier metal having a high melting point and aluminum (col. 3, lines 39-66 and Fig. 1). Hirakawa discloses that the barrier metal having a high melting point is molybdenum nitride (col. 4, lines 5-8). Hirakawa discloses that the barrier metal layer is below the aluminum layer in the frame of reference of Fig. 1 (col. 4, lines 5-8), and Fig. 1 shows that the barrier metal/aluminum laminate film (item 106) is laminated on the interlayer insulating film (item 104); therefore, Hirakawa

discloses that the molybdenum nitride barrier metal layer is in contact with both the interlayer insulating film (item 104) and the aluminum layer. Therefore, one of ordinary skill in the art would have recognized to have provided a molybdenum nitride layer between the insulating film (item 42) and the reflective metal film (item 38) of Mitsui et al. in such a manner that the molybdenum nitride layer is in contact with both the insulating film and the reflective metal film since molybdenum nitride is a notoriously well known barrier metal having a high melting point for use as a barrier layer that separates insulating and aluminum layers as taught by Hirakawa.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a molybdenum nitride layer between the insulating film (item 42) and the reflective metal film (item 38) of Mitsui et al. in such a manner that the molybdenum nitride layer is in contact with both the insulating film and the reflective metal film since molybdenum nitride is a notoriously well known barrier metal having a high melting point for use as a barrier layer that separates insulating and aluminum layers as taught by Hirakawa.

In regard to claim 16, Mitsui et al. teach that the reflective metal film (item 38) is in electrical communication with a drain electrode (item 37 of Mitsui et al.) of the TFT through a contact hole (item 43 of Mitsui et al.) defined in the insulating film (item 42) (col. 9, lines 43-52 and Fig. 5). Furthermore, since Fig. 5 of Mitsui et al. shows that the reflective metal film (item 38) extends well to the right of the contact hole (item 43) along the insulating film (item 42), the combination of Mitsui et al. with Hirakawa results in the combination of the reflective metal film (item 38) located over and contacting the molybdenum nitride at least in areas spaced apart from the contact hole (e.g. the bumps 42a, or any given group of bumps, excluding the first bump to

the right of the contact hole 43 are "areas spaced apart from" the contact hole, col. 9, lines 53-59).

In regard to independent claim 11, Mitsui et al. teach a liquid crystal display (LCD) comprising at least one thin film transistor (TFT) (item 40), an insulating layer (insulating film, item 42) at least partially provided over the TFT (see Fig. 5), address lines (item 39) of the LCD in communication with the TFT (col. 9, lines 43-52 and Fig. 6) and at least one reflective pixel electrode (reflective metal film, item 38) defining at least part of a pixel of the LCD (col. 9, lines 43-55).

Mitsui et al. fail to teach a film comprising molybdenum in direct contact with the under-side of the reflective pixel electrode, so that the molybdenum is in direct contact with the under-side of the reflective pixel electrode and an upper surface of the insulating layer between which the molybdenum is directly sandwiched.

Hirakawa, however, discloses a semiconductor device comprising a laminate of an interlayer insulating film (item 104) and a film (item 106) that is a laminate of a barrier metal having a high melting point and aluminum (col. 3, lines 39-66 and Fig. 1). Hirakawa discloses that the barrier metal having a high melting point comprises molybdenum (col. 4, lines 5-8). Hirakawa discloses that the barrier metal layer is below the aluminum layer in the frame of reference of Fig. 1 (col. 4, lines 5-8), and Fig. 1 shows that the barrier metal/aluminum laminate film (item 106) is laminated on the interlayer insulating film (item 104); therefore, Hirakawa discloses that the molybdenum barrier metal layer is in direct contact with the under-side of the aluminum layer, so that the molybdenum is in direct contact with the under-side of the aluminum layer and an upper surface of the interlayer insulating film (item 104) between which the

molybdenum is directly sandwiched. Therefore, one of ordinary skill in the art would have recognized to have provided a molybdenum layer between the insulating film (item 42) and the reflective metal film (item 38) of Mitsui et al. in such a manner that the molybdenum barrier metal layer is in direct contact with the under-side of the reflective metal film, so that the molybdenum is in direct contact with the under-side of the reflective metal film and an upper surface of the insulating film between which the molybdenum is directly sandwiched.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a molybdenum layer between the insulating film (item 42) and the reflective metal film (item 38) of Mitsui et al. in such a manner that the molybdenum barrier metal layer is in direct contact with the under-side of the reflective metal film, so that the molybdenum is in direct contact with the under-side of the reflective metal film and an upper surface of the insulating film between which the molybdenum is directly sandwiched since molybdenum is a notoriously well known barrier metal having a high melting point for use as a barrier layer that separates insulating and aluminum layers as taught by Hirakawa.

In regard to claim 17, Mitsui et al. teach that the pixel electrode (item 38) is in electrical communication with a drain electrode (item 37 of Mitsui et al.) of the TFT through a contact hole (item 43 of Mitsui et al.) defined in the insulating layer (item 42) (col. 9, lines 43-52 and Fig. 5). Furthermore, since Fig. 5 of Mitsui et al. shows that the reflective pixel electrode (item 38) extends well to the right of the contact hole (item 43) along the insulating layer (item 42), the combination of Mitsui et al. with Hirakawa results in the combination of the reflective pixel electrode (item 38) located over and contacting the film comprising molybdenum nitride at least in areas spaced apart from the contact hole (e.g. the bumps 42a, or any given group of bumps,

excluding the first bump to the right of the contact hole 43 are "areas spaced apart from" the contact hole, col. 9, lines 53-59).

17. Claims 3, 8, 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsui et al. in view of Hirakawa and in further view of Kurogane et al.

Mitsui et al. and Hirakawa teach the liquid crystal display as discussed above.

In regard to claims 3 and 8, Mitsui et al. and Hirakawa fail to teach that the film comprising molybdenum nitride has a nitrogen content between 5 atomic % and 30 atomic %. However, Kurogane et al. disclose a liquid crystal display (col. 9, lines 13-15) comprising a film comprising molybdenum nitride (item 9) (col. 2, lines 49-55 and col. 6, lines 3-5). Kurogane et al. disclose the variation of ratio of flow rate of N_2/Ar during the Mo film deposition in order to vary the resistance of the film comprising molybdenum nitride (col. 4, lines 51-62 and col. 8, line 63-col. 9, line 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to tailor the nitrogen concentration in the film comprising molybdenum nitride of the LCD taught by Mitsui et al. and Hirakawa via variation in the processing parameters during nitrogen deposition into the Mo film in order to achieve the desired properties, such as resistance, depending on the desired end result as taught by Kurogane et al. since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art in the absence of unexpected results. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

In regard to claim 10, Mitsui et al. and Hirakawa fail to teach that the LCD comprises an electrode comprising indium-tin oxide (ITO) formed on the same substrate on which the reflective metal film is formed, wherein the film comprising molybdenum nitride is provided at

least partially between the reflective metal film and the electrode comprising ITO. Kurogane et al., however, disclose an LCD comprising an ITO electrode (col. 1, lines 13-16 and col. 6, lines 7-11 and item 13, Fig. 1) formed on the same substrate on which the reflective metal film (aluminum alloy metal film, item 8) is formed, wherein the molybdenum nitride layer (item 9) is provided between the reflective metal film (item 8) and the electrode comprising ITO (item 13). Kurogane et al. disclose that the electrode comprising ITO is a pixel electrode and that it is well known to use electrodes made of ITO as pixel electrodes in LCDs (col. 1, lines 12-20). Therefore, one of ordinary skill in the art would have recognized to have provided the LCD taught by Mitsui et al. and Hirakawa with an electrode comprising indium-tin oxide (ITO) formed on the same substrate on which the reflective metal film is formed, wherein the film comprising molybdenum nitride is provided at least partially between the reflective metal film and the electrode comprising ITO since it is notoriously well known to provide electrodes made of ITO as pixel electrodes in LCDs such that a film comprising molybdenum nitride is provided at least partially between the reflective metal film and the electrode comprising ITO as taught by Kurogane et al.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the LCD taught by Mitsui et al. and Hirakawa with an electrode comprising indium-tin oxide (ITO) formed on the same substrate on which the reflective metal film is formed, wherein the film comprising molybdenum nitride is provided at least partially between the reflective metal film and the electrode comprising ITO since it is notoriously well known to provide electrodes made of ITO as pixel electrodes in LCDs such that a film

comprising molybdenum nitride is provided at least partially between the reflective metal film and the electrode comprising ITO as taught by Kurogane et al.

In regard to claim 13, Hirakawa teaches the electronic device as discussed above. Hirakawa fails to explicitly teach that the device comprises a plurality of TFTs on the substrate wherein the insulating layer is formed at least partially over the TFTs. Kurogane et al., however, disclose that an active matrix substrate in an LCD is provided with a plurality of TFTs arranged in a matrix (col. 1, lines 12-17) and that a surface protective layer (item 11, equivalently an insulating layer as Applicant characterizes the surface protective layer 11 on page 8 of Paper 10 filed February 11, 2003) covers the TFT (col. 6, lines 3-12 and Fig. 1). Therefore, one of ordinary skill in the art would have recognized to have provided a plurality of TFTs on the substrate of the electronic device of Hirakawa in order to utilize the electronic device of Hirakawa as an LCD as taught by Kurogane et al., and to have at least partially covered the TFTs with an insulating layer since it is notoriously well known to cover TFTs with an insulating layer in order to protect the TFTs as taught by Kurogane et al.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a plurality of TFTs on the substrate of the electronic device of Hirakawa in order to utilize the electronic device of Hirakawa as an LCD as taught by Kurogane et al., and to have at least partially covered the TFTs with an insulating layer since it is notoriously well known to cover TFTs with an insulating layer in order to protect the TFTs as taught by Kurogane et al.

ANSWERS TO APPLICANT'S ARGUMENTS

18. Applicant's arguments on pages 6-9 of Paper 5 regarding the 35 U.S.C. 102(e) rejection of claims 1 and 12 made of record in Paper 11 and the respective 35 U.S.C. 103(a) rejections of independent claims 7 and 11 made of record in Paper 11 are rendered moot due to the withdrawal of all of the art rejections made of record in Paper 11 due to Applicant's amendments in Paper 13.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter B. Aughenbaugh whose telephone number is 703-305-4511. The examiner can normally be reached on Monday-Thursday from 9:00am to 6:00pm and on alternate Fridays from 9:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on 703-308-4251. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

wba
09/16/03 WBA

HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772

9/16/03